REMARKS

The applicants appreciate the Examiner's thorough examination of the Application and request reexamination and reconsideration of the Application in view of the following remarks.

The Examiner objects to claim 37 under 37 CFR §1.75(c) as allegedly failing to further limit the subject matter of a previous claim. Applicants herein amend claim 37 to correct a typographical error to state that the processor of independent claim 28 further includes a concentration determining device. No new subject matter is added by this amendment since this is clearly shown in Fig. 1 and described at page 10, lines 11-13. This amendment is not made for reasons related to patentability since the amendment only corrects a typographical error.

Claims 31-33 and 42 stand rejected under 35 U.S.C. §112, second paragraph. Applicants herein amend these claims to correct the claim dependency in claims 31-33 and to correct typographical errors in 33, 37 and 42. No new matter is added by these amendments and the amendments are not made for reasons related to patentability because they only correct typographical errors.

Claims 26-40 and 42 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over U.S. Patent No. 5,212,988 to White et al. in view of U.S. Patent No. 5,918,258 to Bowers.

White et al. shows an ultrasonic sensing device that uses a Lamb wave propagation medium. White et al. describes that the described apparatus marks a departure from the use of SAWs or Rayleigh waves in ultrasonic sensors and instead

employs Lamb waves. White et al. do not disclose, however, depositing a measured quantity of a solution on a sensor having a membrane layer and allowing the solution to evaporate until particles remain on the membrane layer, as claimed by Applicants. Furthermore, White et al. also does not disclose or suggest automatically calculating the concentration of particles in the solution based upon the measured quantity of the solution and the mass of the particles.

To overcome the deficiencies of White et al., the Examiner combines it with Bowers. However, the Examiner's combination of White et al. and Bowers is improper since White et al. strongly teach away from combining it with a reference such as Bowers. Throughout the Background of the Invention and the Summary of the Invention, White et al. describes the disadvantages of using SAW sensing devices, such as that disclosed in Bowers. For example, White et al. teach that:

> A number of problems arise in SAW sensing devices due to SAW characteristics or to the characteristics of the medium required for SAW propagation. One such problem is that it is difficult to operate SAW sensors while they are immersed in most liquids, a problem rendering them inappropriate for many biological and chemical sensing applications. The reason is that when SAW devices are immersed, the SAW velocity is higher than the velocity of sound waves through the liquid; a large amount of the SAW energy is therefore radiated into the liquid, and the wave is attenuated as it travels along the propagation medium.

(Emphasis added.) (White et al. at column 2, lines 1-12.) White et al. further teaches away from combining it with SAW sensing devices:

> The invention marks a departure from the use of SAWs or Rayleigh waves in ultrasonic sensors and employs instead Lamb waves, which are also known as plate mode waves. Lamb waves can propagate only a material of finite thickness. In contrast to SAWs, which require a propagation medium having a thickness on the order of tens to hundreds of times the wavelength of the SAW propagating therethrough, Lamb waves

> require a propagation medium which is at most only several wavelengths thick.

(Emphasis added.) (White et al. at column 3, lines 11-20.) White et al. further teaches that:

> Thus the sensor may be operated while immersed in fluids. This is in contrast to SAW sensors, in which SAW velocities are higher than the velocity of sound through most fluids, a characteristic which renders typical SAW sensors inappropriate for operation while immersed in fluids.

(Emphasis added.) (White et al. at column 5, lines 49-54.) Many other references are in White et al. that teach against the use of SAW sensing devices. Thus, White et al. strongly teaches away from the use of SAW sensing devices and thus strongly teaches against the combination of White et al. with Bowers. Thus, the combination of these references is clearly improper.

Moreover, the Examiner has failed to provide an adequate reason in the first place why it would be obvious to combine White et al. with Bowers. In the Office Action dated March 4, 2004, the Examiner merely alleged that, "it would have been obvious in view of Bowers to provide a known volume of the liquid on the sensor of White et al. in order to measure the level of a non-volatile residue in the liquid." However, this statement does not provide any evidence of a teaching, motivation, or suggestion to select and combine the references.

> When patentability turns on the question of obviousness, the search for and analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See, e.g., McGinley v. Franklin Sports, Inc., 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the]

references," a question of fact drawing on the Graham factors).

"The factual inquiry whether to combine references must be thorough and searching." Id. It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., Brown & Williamson Tobacco Corp. v. Philip Morris Inc., 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000) ("a showing of a suggestion, teaching, or motivation to combine the prior art references is an 'essential component of an obviousness holding'") (quoting C.R. Bard, Inc., v. M3 Systems, Inc., 157 F.3d 1340, 1352, 48 USPQ2d 1225, 1232 (Fed. Cir. 1998)); In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); In re Fine, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) ("'teachings of references can be combined only if there is some suggestion or incentive to do so.'") (emphasis in original) (quoting ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984)).

The need for specificity pervades this authority. See, e.g., In re Kotzab, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000) ("particular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed"); In re Rouffet, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998) ("even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious."); In re Fritch, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992) (the examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references").

In re Sang Su Lee, 277 F. 3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002). White et al. does not provide any teaching, suggestion or motivation to combine its ultrasonic structure with a SAW sensing device, nor does Bowers provide any motivation to combine its SAW sensing device with the ultrasonic structure of White et al. The only teaching to provide a method of measuring the concentration of particles in a solution by depositing a measured quantity of a solution on a sensor having a membrane layer, allowing the solution to evaporate until particles remain on the membrane layer, and automatically calculating the concentration of the particles in the solution is found in Applicants' disclosure, and it is improper for the Examiner to hindsight analysis to use the teaching of the subject invention to combine references to produce the subject invention. As such, the Examiner's combination of White et al. and Bowers is clearly improper.

Claim 26 of the subject invention cites, "A method of measuring the concentration of particles in a solution, the method comprising: depositing a measured quantity of the solution on a sensor having a membrane layer; allowing the solution to evaporate until the particles remain on the membrane layer; driving the membrane layer at a reference resonant frequency; detecting the shift in frequency of the membrane layer due to the mass of the particles; determining the mass of the particles based on the shift in frequency; and based on the measured quantity of the solution and the mass of the particles, automatically calculating the concentration of the particles in the solution." As noted above, White et al. does not teach or suggest allowing a solution to evaporate until particles remain on a membrane layer and automatically calculating the concentration of the particles in the solution. The combination of White et al. with Bowers to overcome

the deficiencies of White et al. is clearly improper since White et al. strongly teaches against the combination of it with Bowers. Independent claims 28 and 30 recite similar features that distinguish over the combination of White et al. and Bowers.

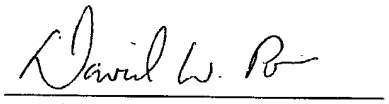
Accordingly claims 26-40 and 42 are patentable over the prior art. Applicants respectfully request that the Examiner withdraw the rejection of these claims.

Claim 41 stands rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over White et al. in view of Bowers and further in view of Ballato. However, since claim 41 depends from independent claim 28, claims 41 is patentable for at least the reasons stated above, and further patentable because it contains one or more additional features.

Accordingly, all claims are allowable over the prior art. Applicants respectfully assert that all claims are in condition for allowance.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned, or his associates, collect in Waltham, Massachusetts, at (781) 890-5678.

Respectfully submitted,



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